DOCUMENT RESUME

ED 448 697 IR 020 460

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TITLE The Evolution of Electronic Pedagogy in an Outcome Based Learning Environment: Learning, Teaching, and the Culture of Technology at California's Newest University--CSU Monterey Bay.
PUB DATE 1999-10-00
NOTE 8p.; In: WebNet 99 World Conference on the WWW and Internet Proceedings (Honolulu, Hawaii, October 24-30, 1999); see IR 020 454. An extended version of this paper with full text of all citations and links is located at the author's Web site: http://indian.monterey.edu/gbaldwin.
PUB TYPE Reports - Evaluative (142) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Access to Information; *Computer Uses in Education; *Distance Education; *Educational Technology; Higher Education; Instructional Innovation; Models; *Outcome Based Education
IDENTIFIERS *California State University Monterey Bay; Learning Environments; *Technology Utilization

ABSTRACT

California State University Monterey Bay (CSUMB) is the newest university in the CSU system. CSUMB's vision statement distinguishes the institution from others in the system by promoting learning paradigms of Outcome Based Education (OBE) and communication technologies of distributed learning (DL). Faculty are committed to the experimental use of technologies as resources to people, catalysts for learning, and providers of increased access and enriched quality learning. The university begins its fifth year in its commitment to create a culture of innovation in conceptual design and organization, embracing OBE and DL paradigms. This formative narrative of the institution's experiences concludes that: CSUMB has had difficulty finding faculty with sufficient pedagogical experience with multimedia teaching tools and OBE to move directly to the new paradigm; and the organizational structure of University Learning Requirements (ULR) committees has mandated assessment by courses rather than a true OBE approach. (Author/MFS)

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The Evolution of Electronic Pedagogy in an Outcome Based Learning Environment: Learning, Teaching, and the Culture of Technology at California's Newest University- CSU Monterey Bay

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Abstract: CSU Monterey Bay is the newest university in the CSU system. CSUMB's vision statement distinguishes the institution from others in the system by promoting learning paradigms of Outcome Based Education (OBE) and communication technologies of distributed learning (DL). Faculty are committed to the experimental use of technologies as resources to people, catalysts for learning and providers of increased access and enriched quality learning. The university begins its fifth year in its commitment to create a culture of innovation in conceptual design and organization; embracing outcome based education and distributed learning paradigms. Baldwin's formative narrative of the institutions experiences concludes that: 1) CSUMB has had difficult to find faculty with sufficient pedagogical experience with multimedia teaching tools and outcome based education to move directly to the new paradigm, 2) the organizational structure of ULR Committees has mandated "assessment by courses" rather than a true OBE approach.

Acknowledgements: The author would like to acknowledge the input for this paper from Dr. Armando Arias, Dean and Dr. Juan Gutierrez at the Social and Behavioral Science Center, CSU Monterey Bay.

Introduction

In 1994, California State University Monterey Bay was among the first public universities to develop a technological infrastructure- from the ground up - to deliver an educational curriculum using a multimedia Intranet/Internet design. In conjunction with the technology, the university planning faculty began with a mandate to create an "outcome based" educational model of collaborative learning and teaching that would promote transdisciplanary learning. Our ability to do so was based on support from defense conversion funds from the military as well as funding from the CSU system. CSUMB was created on the site of the former military base Fort Ord and from the beginning we were viewed as a national model demonstrating how to convert a military base into an economic engine, mediating the negative impact of a military base closure on the tri-county region. During the past four years, CSUMB has explored how to fully utilize the computer-mediated multimedia technology that was installed as a distributed method for course delivery. As we move into our fifth year of operation, we are taking our first steps toward integrating our teaching technologies with outcome base learning, enrollment and assessment management systems. "Contact hours," "seat time", and "the virtual campus" are constantly part of our day to day dialog. CSUMB is on the forefront of the CSU system's expressed interest to develop an outcomes based educational system which would replace the traditional credit-based system of graduation. Those hopes, as well as our recognition of the dramatic demographic shifts in the California population are reflected in the institution's vision statement, found at http://www.monterey.edu/general/vision.html. This "transformation" has occurred under the watchful eye of the state of California during a political period in which affirmative action has been challenged in California and and rival on-line university systems are being created both nationally and globally. For these reasons, CSUMB is a fascinating experiment in the application of distributed learning technologies to the teaching and learning paradigm of OBE. All of this in a political atmosphere of multiculturalism and transdisciplinary training! We do not have traditional majors or departments.

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Distributed Learning at CSUMB

Where distance learning is understood to be pedagogy that attempts to replicate the classroom ambiance across geographic space, distributed learning (DL) involves the acceleration of interactions between teachers, researchers and students using electronic networks to communicate. DL may use the technologies of distance learning, but the focus in not on providing "education at a distance", it is on providing learning on demand regardless of the student or teachers' location - on or off campus. When integrated into instruction, the technology encourages teachers and students to reevaluate the traditional role relationships that have existed in western education. We eliminate the temporal and spatial restrictions on the instructional process and blur the distinctions between "distance" and "campus-based" education. changing the way in which students gain knowledge and faculty teach. California has a state wide initiative that is intended to leverage institutions to weave outcome based learning and technology together. The OBE philosophy is embodied in the Cornerstone Report and the use of technology is a CSU initiative. *The goal of the CSU technology initiative, as we understand it, it to enable all to communicate with one* another and to interact with information resources vital to teaching and learning from anyplace to anyplace at anytime.

At CSUMB, learning and teaching incorporate traditional classroom faculty performances (face-to-face) with video-taped lectures, streaming audio and video (this fall) , and interactive mulitimedia web pagers. Faculty create learning experiences that address the 13 University Learning Outcomes (ULR's) that have replace the traditional general education requirements of sixty plus units of credit. Students graduate when assessed as competent, not just because they completed 124 units. Major Learning Outcomes (MLO's)- our the requirements for a degree in a major. Some of our majors have been quite successful in moving curriculum content onto our network, making the information typically transmitted during a class lecture or lab accessible to the student independent of the class or professor who teaches it. Such courseware will ultimately allow our students to study independent of faculty members or even school schedules. The objective of the faculty planners was to create a "smart campus" from the ground up, rather than patching together the technologies into an existing architecture. To that extent, we have been very successful in creating a campus with an information infrastructure supporting widespread integration of technology into the educational process. CSUMB faculty and staff have multimedia workstations, and each student has assured access to a computer. As part of CSUMB's assured access policy, approximately 80 per cent of students bring a computer to campus with them, or buy one through one of CSUMB's attractive purchase/lease plans. Computer labs are available in the Library, Media Learning Center and dorms for students who do not have their own computers. Classrooms, labs, offices and residence halls are networked. Each student has an email account, at least 10 Mbytes of private server storage, access to Internet and an area for publishing electronically on World Wide Web. Electronic mail serves as the primary form of communication, scheduling, and document distribution mechanism. The ***FirstClass*** server (computer-mediated conferencing software) links students to each other via email and chat room to faculty, and to drop boxes for submission of course materials.

Our library has 15 full-time staff and regional and national access to on-line reference materials. Learners have access to more than 4,000 full text on-line journals through Lexis-Nexis, EBSCO, Masterfile, Expanded Academic ASAP, Business and Company ASAP, Academic Press IDEAL, Project MUSE, Novosoft, and World Wide Web publications. Students may also order journals and books from inter-library loan electronically. Linkages to partner libraries permit shared materials. The library staff have produced custom web browser interfaces to many databases, making access to information very intuitive. In fact, access is so simple, the author is concerned that students may not be able to use traditional libraries when they graduate from our campus Many faculty, encouraged by campus initiatives and tenure/promotion schemes are working to place their course syllabi and assignments on webservers. In fact, in the some departments faculty have converted their desktop machines to webservers for the express purpose of curriculum design and delivery. The day of the desktop educator has appeared! Work is distributed electronically via campus servers and handed in automatically into write-only drop folders via electronic mail. It is becoming routine for students to produce artwork, do research, submit assignments, make appointments, and create and perform class presentations, all by computer. They

communicate among themselves and discuss work with their instructors on-line. They use collaborative document techniques to work together, use spreadsheets and charts to portray numerical information, and make multi-media portfolios used for the assessment of their work. They are skilled at using scanners, digital cameras, and projection equipment, and most can make Web pages. A server is dedicated to student work, and any student may create a home page and link it to CSUMB. Off course, this is not an electronic utopia.

Our studies show that the use of our campus network is varies dramatically when the ethnicity, gender and educational level of our students, aculty and staff. Universal access and use of our network has been a goal the we have not achieved. In fact, we are only beginning to understand the unintended impact of using our multimedia network to move curriculum to students. The effective use of the technology for teaching and learning varies widely from one major to another and there are remarkable differences between individual faculty in their ability to incorporate (much less embrace) the teaching philosophy promoted by DL and OBE. For students, barriers to using our network have been gender (women are less likely to use it) , length of exposure to computer technology (transferring students with no computer training suffer), and cultural factors that have not yet been examined and that we simply do not understand yet. Faculty barriers to access a two fold: 1) lack of training and exposure to multimedia networks has retarded the development of multimedia DL curriculum and 2) there are as yet no contracts defining faculty rights to the content they create or provide online Frankly, if a faculty member can make all of their "courses" (or learning experiences) available on-line, it means that ALL courses can be offered EVERY semester! The ramifications of this for calculating faculty load and full-time equivalency (FTE) are just now being examined.

Outcome Based Education at CSUMB

Outcome based assessment is not well understood by most faculty in the United States, for the simple reason that we were not exposed to it. As teachers, we tend to use the same techniques and philosophies that were used to train us. Most of today's educators were products of traditional schools that graduated us based on the credits we accumulated by taking classes, listening to lectures, and taking tests. The closest that most college professors came to OBE was the preparation of the thesis or dissertation. You may complete your cousework in graduate school, but without a thesis, you can not graduation. OBE separates course completion from the satisfaction of educational requirements. In other words, it is not time in a seat and the accumulation of units that leads to degree completion, it is the independent assessment of student competency. Most of our planning faculty understood this: many of us visited universities that were experimenting with OBE in their curriculum and in turn, we have been visited by them. New faculty did not have this exposure and even today there are many of our professors at CSUMB who do not understand what OBE is and may not be fully committed to it. OBE functions as follows at CSUMB.

Under the guidance and supervision of faculty, students are required to develop an Individual Learning Plan (ILP) that defines the *pathways* to achieve the 13 required university learning requirements (ULRs) and major learning outcomes (MLO's) Like many of our practices, this varies from Center to Center or major to major. However, the flexible learning principle is fairly ingrained in our campus culture, and it forces greater emphasis on the learning process. Faculty attention is focused on developing their courses with student learning outcomes central to curriculum content, presentation and specified deliverables. Because the MLO's and ULR's are defined by the university, courses (or other learning experiences) that do not provide content and deliverables addressing them are not helpful for a student to graduate. The original idea behind our outcomes based model was that students could learn on their own, with others, and through many different experiences rather than a fixed number of required courses. Although courses offered by faculty would be useful for assisting students to become competent, our objective was to provide many different pathways for learning students. Students would become "active learners" and the role of faculty would increasingly be that of assessor of student achievement, rather than content deliverer. Students would become less dependent on the information and learning assignments provided by faculty in class and more dependent on their own initiative and judgment as learners.

Technology was to play an important part in the empowerment of the learner as well as influence the role of the teacher-as-assessor. This is still a distinct possibility, but as a critical reviewer will see in the discussion that follows, traditional pressures for majors (called Centers and Institutes) to capture FTE in order to boost Center budgets, has resulted in a large number of Institutes that now *require courses* for graduation, intentionally derailing the original idea of allowing students to gain mastery from a body of learning modules or outcomes shared across disciplines, specified as part of their Individual Learning Plan.

Planning faculty (the first dozen hired to operationalize our learning outcomes) viewed competency assessment as central to OBE. The ULR's and MLO's were not to be centralized in any one "course" - as they currently are -- the learning outcomes were to be embedded throughout the curriculum in a cross disciplinary fashion. Early proposals were for curriculum modules (computer assisted learning - CAL) to be developed by faculty - or purchased out right by the university from commercial firms - that addressed the ULRs. Such modules -- or faculty sponsored learning experiences -- would allow students to develop products that could be assessed *independent of the faculty who facilitated the students learning*. In removing assessment from the faculty member, we believed that we could end social promotion, grade inflation, and identify poor teachers. This has turned out to be one of the most controversial aspects of our teaching philosophy. Our original vision of assessment independent of faculty still exists, but competes weakly against faculty sponsored ULR Committees that have developed a procedure for approving class syllabi that are said to address the ULR's. For most students on our campus, they need only take a class and get a passing grade (C-) which the ULR Committee has *officially approved as meeting the ULR* . In summary, for the most part, students now take classes, must get passing grades, and faculty do the assessment. By requiring a fixed set of classes within a major (in the funding battle for FTE) not only have we moved away from a true OBE model, we are closing the door on transdisciplinary learning.

In this authors view, true OBE puts the emphasis on the student's demonstration of what s/he knows and is able to do, not on completing a pre-determined set of courses. The CSUMB model - as we originally envisioned it - required that professors state in advance of instruction the learning outcomes students were expected to achieve (as a result of their teaching) and it required that students understand that they must demonstrate proficiencies associated with those outcomes independent of college units and classes in order to graduate. Our website describes the required ULR's as "...(the system) works a little bit like getting your driver's license. To get a driver's license, you need to demonstrate that you know how to drive and that you know the rules of the road. You can learn these things in a variety of ways, for example, taking private lessons, doing trial and error, or some combination. When you do get your license, you are not held accountable for how you learned to drive, but rather for demonstrating that you are able to drive "(http://www.monterey.edu/academic/ulr). We operationalized the University Learning Requirements as 13 ULR's and each major operationalized their own specialized learning requirements as Major Learning Outcomes (MLO) - sometimes called ULO's and MLO's (where the "O" stands for outcomes). The 12 ULR's are: Community Participation, Creative Arts and Expression, Culture and Equity, Democratic Participation, English Communication, Ethics, Language, Literature and Popular Culture, Mathematics Communication, Science, Technology/Information, United States History, and Vibrancy. It is beyond the scope of a paper this size to address the evolution of each of our MLOs. However, four of the ULR's deserve critical review because unlike the other nine, these four are required for *all* students at the university, including transferring juniors. Three of those four will be addressed in this paper. The additional nine are required of those that enroll as freshmen or sophomores, as a replacement for the general education requirements at traditional CSU's. These four are: **Technology and Information, Foreign Language, Service Learning** and **Culture and Equity**. These "special status" ULR's require the closest evaluation and will serve as examples for how CSUMB has operationalized OBE within the DL environment. To satisfy a ULR or MLO, a student must write and proposing an Independent Learning Plan (ILP that selects one of the following three pathways for fulfilling the ULRs.

1. If a student does not already possess the knowledge and skills required by a ULR or MLO, then the student can register for one of the courses which have formally been designated as offering preparation and assessment for that ULR, and the student will be assessed by the instructor(s) right in the course.

2.If the student does not already possess the required knowledge and skills, but he or she has a plan to gain the required knowledge in some way other than taking one of the designated courses, then the student should work out that plan with her or his advisor. After the student has gained the required knowledge through this alternative means, then the student would register for an independent assessment of that ULR.

3.If the student believes that he or she already possess the knowledge and skills contained in a particular ULR, then the student should register for the appropriate independent assessment (ASMT) for that ULR. After registering for the ASMT section corresponding to the ULR, then the student should see the chair of that ULR Committee for instructions on how to prepare for the independent assessment.

(see: http://www.monterey.edu/academic/ulr)

The Technology and Information ULR- One Example

The requirements for this ULR are as follows:

Students must demonstrate comfort with technology and information search and discovery methods. Demonstrate the ability to use tools effectively for the discovery, acquisition, and evaluation of information as well as core computer tools for the manipulation and presentation of information in a creative and ethical manner. Students will demonstrate ability to: 1.use their computers to create, edit and produce attractive documents which conform to a set of given standards. 2.produce a clear, cogent representation of tabular data.3.create a what if analysis on a set of quantitative data, using a spreadsheet. 4.create a pictorial representation of a set of data, using charting or graphing software. 5.successfully use a variety of information resourcesand information search and discovery systems, such as the CSUMB Online Library Catalog, as well as citation, abstract, full-text databases, and the Internet. 6.understand the scholarly publication process and distinguish popular from scholarly treatments and primary from secondary resources. 7.effectively attribute sources according to existing standards and use software tools for the maintenance and construction of bibliographic information. 8.evaluate information by referring to indicators of quality and accuracy. 9.create an aesthetic electronic presentation which includes images and data. 10.participate in the CSUMB electronic community. This includes the computing environment, including servers, electronic conferences, and electronic mail. 11.use computers in the creation of an artistic product. 12. demonstrate an understanding of "netiquette", intellectual property/copyright, and of ethical use of technological tools.

The success of the Technology ULR curriculum can be understood when we see how it was created. Consultants (later to become part time faculty or staff) developed this curriculum under contract. The curriculum was originally treated as public domain, but has recently been treated in a more proprietary manner. Developed under contract, the curriculum is not owned any single faculty member, thus part-time faculty are typically hired to administer it, at great savings to the university. As you might imagine, this model of OBE sets the stage for an institution is primarily composed of part time faculty, and indeed CSUMB is currently staffed at over 60% part time with the lowest number of tenured faculty in the CSU system! It is obvious to many of us that when we allow curriculum to be own by the university so that students can achieve learning outcomes independent of a faculty member, assessment becomes the primary activity of a teacher, not pedagogy!

Operationalizing the performance criteria of the Tec ULR was not a highly political process, given that the outcomes were for the most standard computer applications well understood by industry as relevant to the modern electronic office. The infusion of technology into much of our pedagogy as well as the culture of the institution has lead many students to choose assessment, rather than a class, for demonstrating competency. In summary, the Technology and Information ULR is our best example of independent competency assessment, fully operationalized and described on the supporting university web

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site. The outcome has been easy to operationalize. Technology tutorials are readily available online and owned by the university, not faculty. Students are increasingly fulfilling this requirement by assessment.

Service Learning and Culture and Equity: A Second Example

Where the Tec ULR may be viewed as a relatively noncontroversial set of learning outcomes, Service Learning and Culture and Equity share the common characteristic that students must demonstrate an implicit set of *values* as *well as content master*-y. When we assess for Learning Outcomes that require students to demonstrate normative (non-academic) values, we engage in a highly controversial area of education. . Within these two ULR's, " college literacy" has been defined to include the demonstration of approved values and social behaviors such as volunteerism for Community Participation and demonstrating a "commitment to work for social equity" in C&E. These values are deemed as necessary for students to be "literate citizens in a multicultural, global society" and represent perhaps the most controversial aspect of our learning requirements.

Service Learning has proven itself to function usefully in the curriculum. For the past three years the ULR has not been well understood - many faculty asked the question, "how is volunteerism expected to contribute to student literacy"? Outcomes in service learning have been operationalized as a) **Civic Participation and Self Efficacy)**, b) **Career Preparedness** and c) **Academic Relevance**. These outcomes are assessed by the application of the Student Service Assessment Questionnaire. Pre-testing and post-testing of students with the "service learning scale" have demonstrated that students (after the SL experience) see contributing to the community as more important than before the experience and believe themselves to be more comfortable in such situations. They claim to be more prepared for the world of work, and their motivation to enroll in classes that have "real-life" applications and "hands on experience" (Service Learning Research Student, January 1999). On our campus, the Service Learning Outcome appears to be functioning quite well in the role of a traditional internship- that is to say, it provides "on the job training (OJT)" that is especially relevant to our younger students. Never-the-less, older students have been known to find this upper division requirement irrelevant to their study and seek alternative assessment based on life time experiences.

What We Have Learned- Recommendations

There are two points that one might conclude from the above discussion. First, CSUMB found it difficult in its search for faculty with sufficient pedagogical experience with multimedia teaching tools and OBE. Over 6,000 resumes were screened for the first appointments of thirty or so teaching faculty. We discovered that of those hired, few could actually meet the 13 ULRs proposed by the planning faculty! Traditional universities require faculty with advanced degrees, not competencies and our selection process netted well qualified traditional academicians. Thus faculty have needed extra time for course preparation, faced with learning to manage multimedia software and students with flexible learning plans. Faculty loads have not reflected the planning and development component of faculty teaching, and overwork has been the result.

Secondly, the ULR Committee structure, which was originally developed as an organizational strategy to promote interdisciplinary study in an OBE environment has slowly recreated the traditional "graduation by taking a course" framework we are all familiar with. Those committees now approve syllabi as meeting MLO's, thus getting a C- in a class fulfills a graduation competency. Centers seek to bolster FTE by requiring courses "within the major" to fulfill MLO's and students can not author ILP's that are transdisciplinary. In contrast, the CSU Chancellors office in its support for OBE, rejects course based assessment in favor of coverall program outcomes, stating that "Each university will strengthen baccalaureate education through student learning outcomes and assessment…Each university will identify student learning outcomes for both General Education and degree program majors, focusing on the outcomes of overall programs rather than individual courses (Cornerstones Report, p. 1). With such a

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mandate, the CSUMB leadership will soon need to address MLO Committees that are restructuring our vision of OBE to that of a more traditional CSU.

An extended version of this paper with full text of all citations and links is located at the author's website.